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(54) Hand-held cleaning device

(57) A fluid-containing brush has a housing (11) with a generally cylindrical wall closed at one end by a base carrying brush bristles (25) and at the other by a cap (50), the housing defining a fluid reservoir, the base having a central opening therein closed by a valve member for dispensing liquid to the brush bristles, and a valve stem (31) which extends up to an opening of the cap (50) which is closed by a web of elastomeric material constituting a button (58) by which the user can actuate the valve to dispense cleaning fluid, with a sealing ring provided between the cap (50) and housing (11).

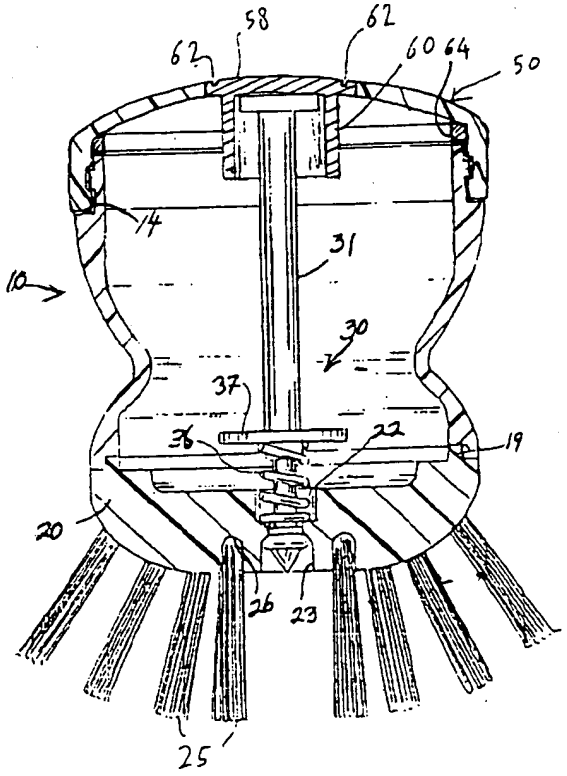

FIG. 5

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ical inner end wall 24. Fixedly secured to the outer surface of the base wall 20 is a suitable scrubbing medium 25 which, in the illustrated embodiment, comprises a plurality of brush bristles, which may be fixed in sockets 26 in the base wall 20 by any suitable means. Although bristles are illustrated, these could equally be replaced by an abrasive pad, scouring pad, wire wool pad, sponge or other similar cleaning media. It will be appreciated that the axial bore 21 provides communication between the interior of the housing 11 and the cleaning medium 25.

[0014] Referring in particular to FIGS- 5-7, the axial bore 21 is closeable by a valve assembly 30 which includes an elongated valve stem 31 extending axially through the housing 11 and through the axial bore 21, being provided at its distal end with a conical head 32. A valve member in the form of a flexible and resilient O-ring seal 34 is seated in a circumferential groove 33 in the stem 31 immediately above the head 32. The stem 31 preferably has a reduced-diameter neck portion 35 adjacent to the head 32, which is surrounded by a helical compression spring 36, one end of which is seated in the bore 22 and the other end of which is seated against a radially outwardly extending annular flange 37 on the stem 31. The upper end of the stem 31 is formed with an enlarged head 38.

[0015] The upper end of the housing 11 is closed by a removable cap 50 which has a generally cylindrical skirt portion 52 and an upper slightly upwardly-doming top portion 54. Removal of the cap 50 allows refilling of the device with cleaning fluid. The cap is preferably formed of a rigid plastics material- The skirt portion of the cap is provided on its inner surface with four equiangularly spaced generally L-shaped recesses 56 having slightly inclined surfaces 57 which co-operate with the lugs 16 on the housing 11 to hold the cap 50 on the housing 11. The cap is fitted by a push and twist action whereby the lugs 16 on the housing 11 engage in the recesses, the cap 50 being urged more tightly onto the housing 11 as it is rotated and the slightly inclined surfaces 57 move over the lugs 16. It will be appreciated that the cap could alternatively be removably fitted on the housing by other means such as a simple screw fit.

[0016] The centre of the cap 50 is provided with an opening which is closed by a thin web formed of a resilient material such as an elastomer which portion constitutes an actuator button 58. The button 58 is of generally oval shape when viewed from above, and is provided with a depending cylindrical skirt 60 into which the enlarged head 38 of the valve stem extends in the assembled device so that in the normal condition this is adjacent the inner surface of the button, as shown in Figure 5- The button 58 is formed with a groove 62 adjacent the periphery thereof. This groove 62 constitutes a portion of reduced thickness which facilities depression of the button-

[0017] Located in the cap 50 at an inner corner between the skirt 52 and upper doming portion 54 there is provided a circular ring 64 of resilient material which is preferably also formed of an elastomer and in particular formed of the same material as the button 58. When the cap 50 is fitted on the housing the uppermost edge of the lip 14 abuts this ring 64 thereby ensuring a reliable fluid-tight connection is achieved. The cap 50 is formed as follows. The main part of the cap is preferably formed of a rigid plastics material which is formed in a conventional mould. The cap is then placed in a further mould defining the shape of the sealing ring 64 and the button 58 and the elastomer moulded thereon in a single moulding step. The single moulding step greatly simplifies the manufacture of the cap. Depending on the precise shape of the mould used to mould the elastomer of the button 58 and sealing ring 64 there may be a residual portion or portions of elastomer extending between the button 58 and ring 64 as indicated at 66 in Figure 4.

[0018] In use, it will be appreciated that the spring 36 resiliently biases the valve assembly 30 upwardly to a normal closed condition, illustrated in FIG. 5, wherein the O-ring seal 34 seats against the wall 24 of the counterbore 23 and cooperates with the stem 31 to seal the opening defined by the axial bore 21. When the actuator button 58 is depressed by the user the stem 31 is also depressed, and the O-ring seal 34 unseats, as illustrated in FIG. 6, permitting liquid soap or other fluid to flow through the axial bore 21 to the scrubbing medium 25, the outward movement of the stem 31 being limited by engagement of the flange 37 with the inner surface of the housing base wall 20. It will be observed that the skirt 60 of the button 58 also deforms as the button is depressed. When pressure is relaxed from the button 58 the valve stem 31 is upwardly returned to the normal closed condition with the seal 34 closing the valve seat.

Claims

1. A hand-held cleaning device comprising a housing constituting a reservoir for cleaning fluid and carrying cleaning means for contacting an object or surface to be cleaned, an aperture through which cleaning fluid may pass closed by valve means which are operable by a user, and a removable cap closing the housing wherein a portion of the cap is formed of resilient material deformable by a user, a part of the valve means extending to said portion of resilient material whereby a user can operate the valve means on deformation of the said portion, and wherein there is provided a sealing ring of resilient material between the cap and housing.

2. A cleaning device according to claim 1 wherein the valve means comprises a valve stem which extends through the housing to the cap having an end portion which lies adjacent an inner surface of the portion of resilient material.

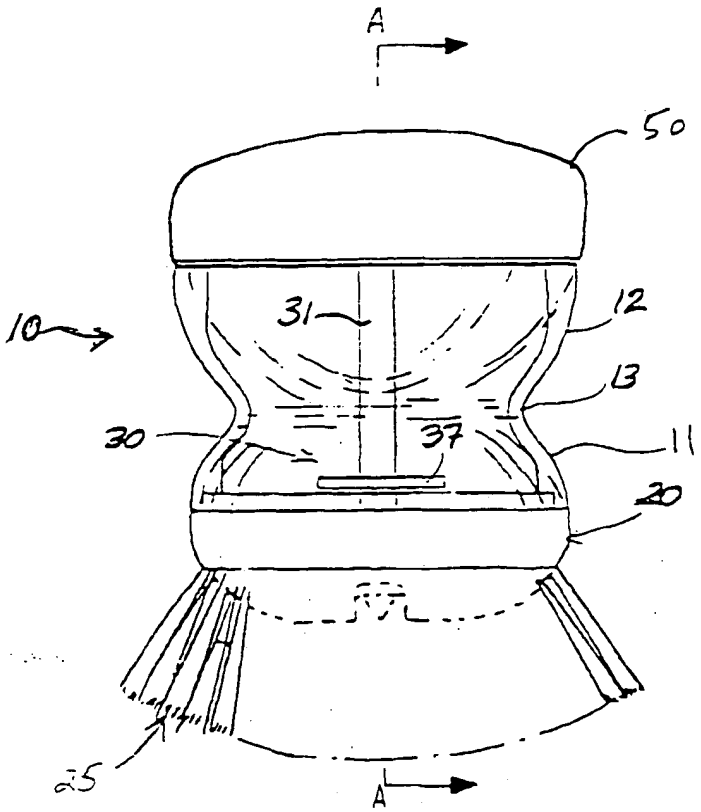

FIG. 1

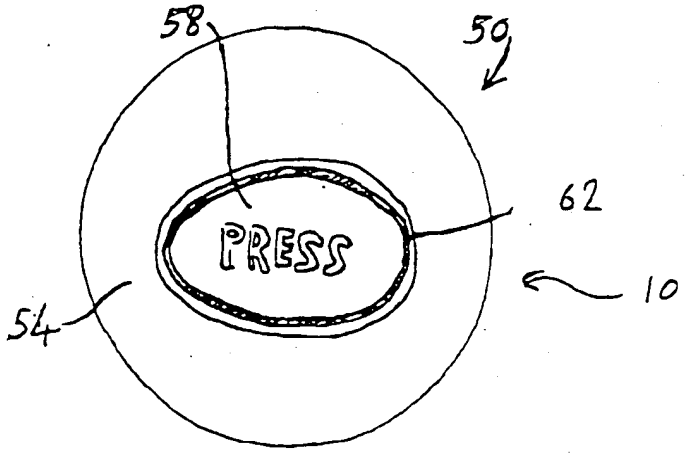

FIG. 2

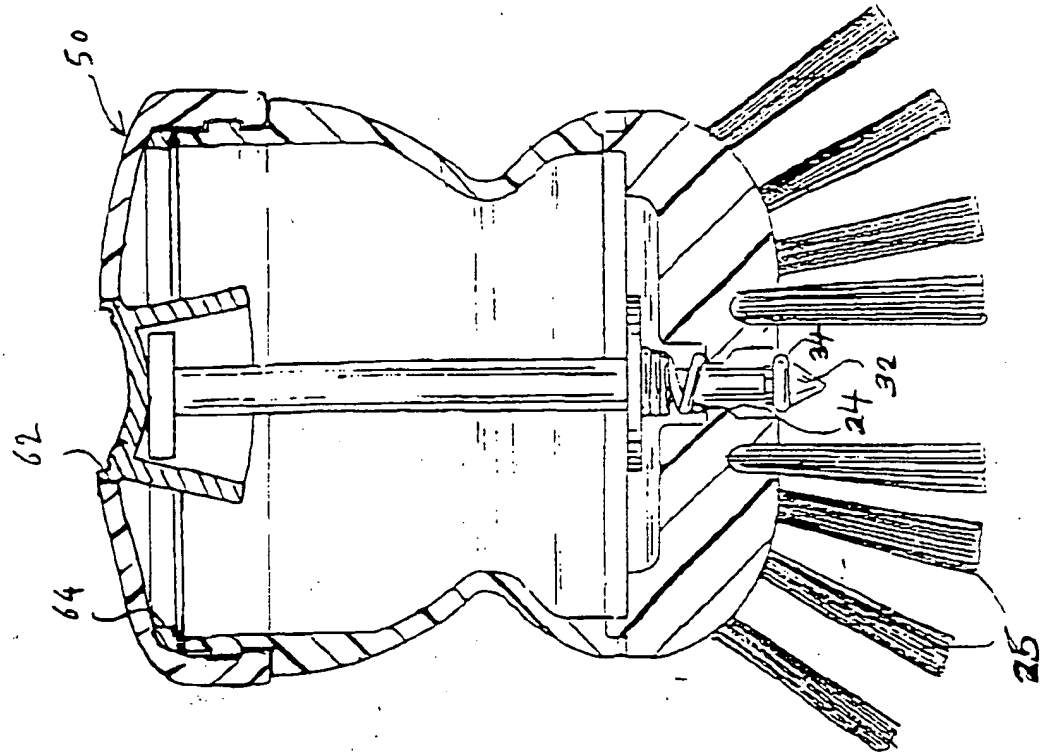
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FIG. 4

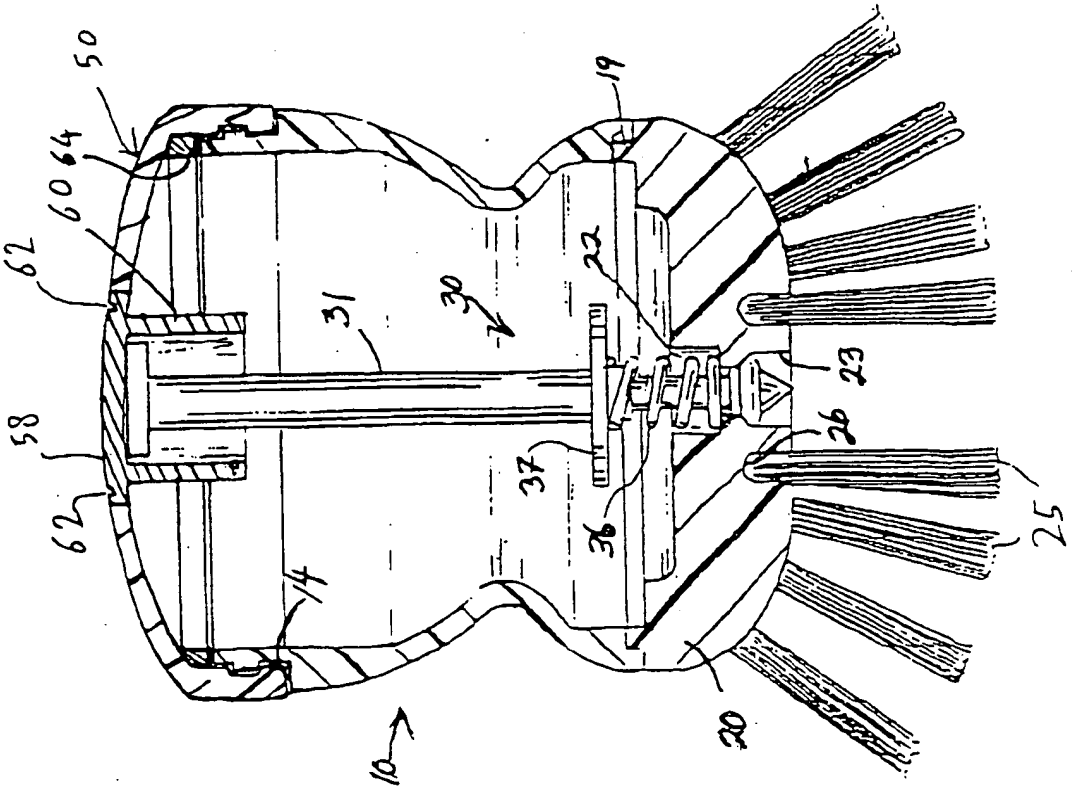
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FIG. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 8977

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 955 746 A (CRAIGMILE JOSEPH M) 11 September 1990 (1990-09-11) * abstract * * column 2, line 8 - line 68 * * figures 3,4 *	1-4	A46B11/00
A		5-10	
X	US 1 865 850 A (GARVEY E.S.) 5 July 1932 (1932-07-05) * column 1, line 19 - line 33 * * column 2, line 61 - line 95 * * figure 1 *	1-4	
A		5-10	
X	US 3 146 484 A (LUSSIER ETAL L.E.) 1 September 1964 (1964-09-01) * the whole document * * figures 4,5 *	1-4	
A		5-10	
A	US 5 114 255 A (VILLARREAL JOSE R) 19 May 1992 (1992-05-19) * abstract; figures *	1-10	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A46B A47L
A	US 4 826 340 A (ROTHWEILER EMIL ET AL) 2 May 1989 (1989-05-02) * abstract; figures *	1-10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 April 2000	Ottesen, R

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